

The Strategy of the Guatemalan Sugarcane Industry Organization for forest restoration in the Pacific Littoral

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SUMMARY

In 2011, the Guatemalan Sugarcane Association -ASAZGUA, through the Private Institute for Climate Change Research (ICC), initiated a geospatial analysis process of forest coverage, land usage, land usage capacity and forest biodiversity; also key actors, mechanisms and certification commitments that contribute to forest restoration of the main watersheds in the sugarcane cultivation areas of Guatemala, as well as the obligations of social and environmental responsibility of their partners.

This analysis concluded with a strategy proposal for forest restoration as the first step towards biological corridors and forest connectivity in the littoral; this strategy will consider the key actors, different mechanisms of implementation which are also subdivided into high, medium and low areas of the watersheds that jointly serve the country as the basis to generate the national strategy for forest restoration.

Key words: Forest restoration, biological corridors, restoration of watersheds, private forest restoration

INTRODUCTION

Guatemala is one of the most vulnerable countries in the world according to the Copenhagen Meeting (COP14, 2009) where Guatemala is placed among the ten most environmentally-vulnerable countries of the planet. This vulnerability is mainly due to its geographic location (between the Pacific and Atlantic Oceans); in addition, Guatemala is situated in a zone affected by three tectonic plates, causing the existence of three active volcanos and high seismic activity; there is also an imminent climatic alteration and variation. However, these contrasting conditions have produced a country rich in biodiversity that has been considered as a country with great diversity (IARNA, 2012): with 10 physical regions, 7 biomes, 14 eco-regions, 66 ecosystems (41 natural and 25 affected by anthropogenic activities) and 14 ecoregions according to the Holdridge system (CONAP, 2008); the topography of the country has played an important role

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for that area of the country, the Pacific littoral, since it has created an important area for agricultural development.

The Pacific littoral of Guatemala has been the ideal location for sugarcane production ; currently, in accordance to the Guatemalan Centre for Sugarcane Investigation and Training (CENGICANA), in the 2012-2013 season, they harvested 263,056 ha, equivalent to 2.5% of the national territory. According to ASAZGUA this crop represented 3% of the GDP of the country in 2013, 31.6% of agricultural exports and 15.36% of total exports of the country, and as part of sugar production the usage of chaff to produce electricity has provided 15.9% of the total annual demand of the country (http://www.amm.org.gt/portal?page_id=145). As the cultivation of sugarcane is of great importance to the country and particularly for the Pacific coast, the sugar sector organization of Guatemala formulated and implemented a strategy for forest restoration as a contribution to the country on this issue and to increase the resilience of this sector to the possible impacts of climate change.

MATERIALS AND METHODS

With the objective of promoting means of forest restoration and mitigation of climate change, ASAZGUA founded ICC in 2010 as an organizational branch contributing to the reduction of vulnerability and mitigation of, and adaptation to, climate change in communities, production systems and infrastructure of the region. This institution is the agent for formulating and implementing forest restoration projects for the Pacific slopes of Guatemala. In 2011, the ICC initiated a process of gathering and analysis of information within the sugar refineries located in this region to better understand development issues in the subject of forestry, mainly the land area devoted to conservation and/or where it has been managed with restoration in view. In 2012 the above actions concluded with a map that gathered together data on these areas. Up to the end of November of this year a total of 10,203.72 ha had been quantified. In the following years the ICC developed various studies to look for opportunities, potentials, actions and key actors on the subject of forest restoration, always with the basis of and focus on watersheds. These actions added up to the inter-institutional relations that the ICC has achieved in a short period of time and mechanisms of environmental certification adopted by their partners, they jointly proposed the creation and implementation of the strategy of forest restoration by the sugar sector.

RESULTS

ICC, as a general objective, planned to contribute to forest restoration of water basins of influence in the cultivation of sugarcane, and to increase the resilience of the communities and

productive systems of the Pacific littoral of Guatemala in the presence of climate change. To achieve this objective five strategic goals are planned:

- Determination of potential areas for restoration and connectivity
- Implementation of mechanisms of forest restoration
- Establishment of production systems of forest plants
- Restoration of the mangrove ecosystem
- Investigation

Agreed earlier, ICC's principal studies and development actions are framed in its strategic goals, described in the following way:

Determination of potential areas for restoration and connectivity

To understand the relationship between forest cover and watersheds, an analysis of the distribution of significant areas with wood cover between the cultivation zones of sugar cane was undertaken in the watersheds of the rivers Coyolate, Achigate and Acome (ICC, 2013). This analysis was carried out taking into account the previous study of the dynamics and forest cover of Guatemala (INAB, OUG, CONAP and URL, 2010), which reflected that much of the forest areas are dispersed or distributed, mainly in lineal form, between the zones of sugarcane cultivation; they were not considered as forest cover beneath the minimum area of study (pixels of 30x30 metres). The analysis resulted in two important areas with forest cover: the National Park Sipacate Naranjo at 0 metres above sea level, located on the coast line, and the volcanic cones of Agua, Fuego, Acatenango and Pacaya at more than 3,000 metres above sea level, as part of the volcanic range of Guatemala. The study identified in these three watersheds a total of 3,345 ha with potential for the restoration of river bank woods; 20,992 ha with potential for forest recovery in areas with capacity for usage that does not compete with agricultural activities and a potential for conservation of approximately 67,000 ha including mangrove forest.

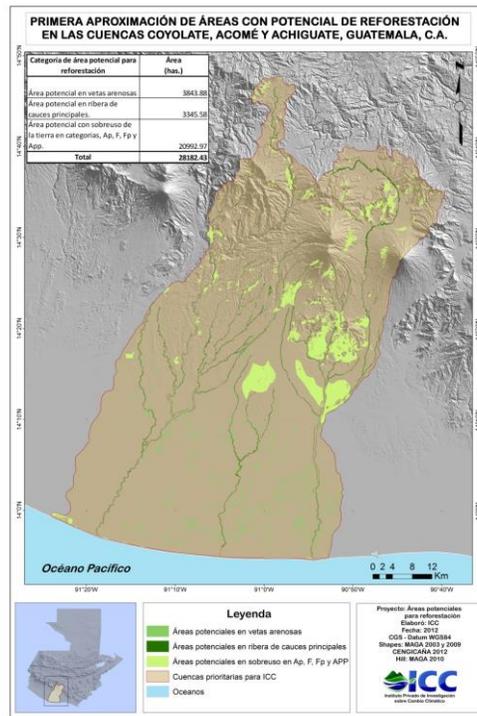


Fig. 1: Map of potential areas of reforestation in three watersheds of the Pacific littoral

Implementation of mechanisms of forest restoration

Under a process of technical analysis and markings in the document ‘Strategy of conservation and restoration of forests in the Pacific littoral as a gateway to mitigation of and adaptation to climate change’ (ICC, 2013) the strategy of restoration to watershed dynamics, potentials and technical feasibility was put in place, by means of various agreed mechanisms as follows:

Restoration of river bank woods: In 2013 a geographic study was made of specific area of potential for forest conservation. On this basis, the creation of a biological corridor between the said areas was analysed, with the understanding of a biological corridor as a ‘mosaic of different types of soil use that is managed to connect fragments of woods across the countryside’ (Bennett 2004, Miller et al., 2001). Two important areas with forest cover were visualised for conservation: the woods of the volcanic range and the woods of the Pacific littoral. In the same analysis the range of permanent rivers was added and it was observed that restoring the riparian forests, with a width of 35 from the natural river bank, can achieve such connectivity. To date, the ICC has reforested a total of 60 ha of riparian forest and continues with a plan of restoration with partners and communities of 60 ha projects per year until 2020, all with special native species of the region. The main partners with whom this mechanism is developed are the sugar refineries and communities of the lower part of the watersheds.

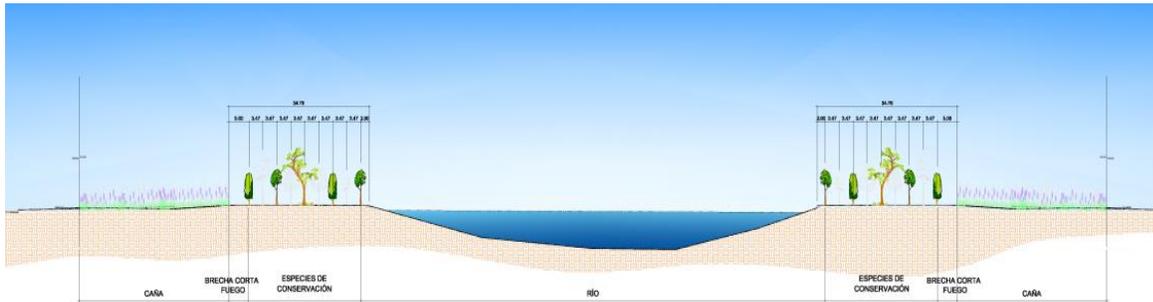


Fig.2: Design of restoration of riparian forests with the aim of conservation promoted by the ICC.

Energy and timber-yielding forests

At the community level, making use of the availability of marginal areas of agricultural production or low community productivity has increased the recovery of forest cover by means of energy and timber-yielding forest use. The involvement of the communities has provided more than 200 ha up until 2014. This model will be replicated in other community associations or land-parcelling over the length of the littoral (mode of tenancy of land conceded by the government to a group of farmers).



Fig.3: Measurement of plantation of two year old *Gmelina arborea* in Nueva Concepcion, Escuintla.

Agri-forestal systems

Under an analysis of geographic information of diverse official ‘sources’ and a table of technical criteria of soil management for high parts of the watersheds of the program of ‘Integrated Management of Watersheds’ of the ICC, a map was generated of areas and technical criteria for priority action in the high part of the watersheds of the rivers Coyolate and Achiguate for forest restoration. With this information the strategy was focused on the incorporation of the tree into the production system of the small-holders; for this the mechanism implemented was the investment in living regional forests and the alliance with free conservation projects for diverse NGOs and municipalities in communities, so that agriculture in the high part of the watersheds could incorporate the tree into their small-holdings as living barriers, screens of wind-break, isolated trees or restoration of eroded areas. To date, more than 200,000 trees have been planted under this mechanism, focused on the areas of high priority: technically the high part of the watersheds of interest and the zones of water regulation, important for the cultivation of sugarcane.

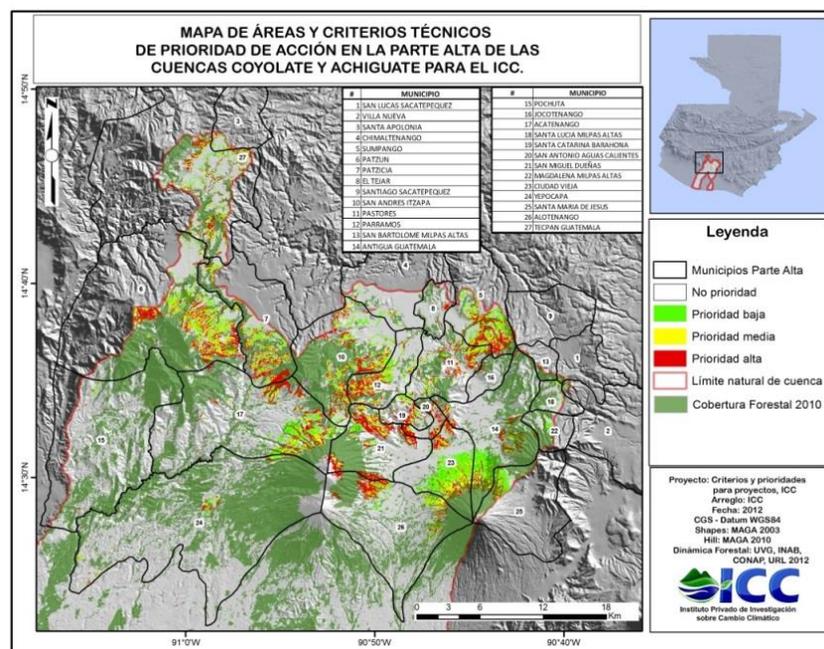


Fig.4: Map of priority action in the high part of the watersheds of the rivers Coyolate and Achiguate for forest restoration

Energy and timber plantations of the partners

The mills associated with ASAZGUA visualised the policy of forest incentives for Guatemala, the creation of energy and timber forests, as a potentially good investment (by 2012 approximately 10,203.72 ha). These reforestations have been established in owned or leased farms of the sugar refineries. Now the ICC, as part of its strategy, contributes technical assessment and benchmarking across the association of the Forest Committee of ASAZGUA in 2011 getting other associated refineries to invest in the establishment of forests for production of biomass, mainly, as a mechanism of productive diversification of the partners.

Establishment of a system of production of forest plants

The Pacific littoral has 18 large watersheds distributed over more than 24,000 km² of land. The ICC has identified the necessity for working in strategic alliances on the theme of restoration of forest cover in their area of influence. For this, a strategy of living forests is required, this includes seven strategic goals between them resulting in identification of sources of native seeds, strategic alliances and strengthening of social and community capacities. By 2014, a total of 62 living forests were counted, distributed in living communes, municipalities, with sugar refineries and owners; as a priority native and energy species are produced, totalling a production of 500,000 plants. Summing up the production from 2012, when this strategy was initiated, more than a million plants have been produced. The task of correlation and technical achievement was done in alliance with government institutions and sugar refineries.

Restoration of mangrove ecosystems

An important ecosystem for the theme of climate change is the mangrove (IPCC, 2013) and, of course, in the studies made by the ICC, this represents an important zone of conservation and has a great potential for restoration. That's why the strategy involved the work with the two government institutions charged with the subject of forestry in the country (National Forest Institution -INAB- and the National Council of Protected Areas – CONAP -), the principal sugarcane partners and the communities of the Pacific littoral. The process has led to the identification of the areas, trial of techniques of restoration, development of technical capacities, investigation into the reproduction of species and activities of restoration; in 2014 a total was reached of 40 ha restored of this important strategic ecosystem of the Pacific littoral of Guatemala.

Investigation

An important component and the basis of the forest restoration strategy is the research. Thus research provides the basis for the strategy of forest restoration and the work that is being done in that subject. In 2014 a series of studies was initiated that are being developed to generate the base line of biodiversity of two watersheds of the Pacific littoral, as the scientific base for the

strategy of forest restoration; these studies are looking at the botanic status, cheiroptera (bats) and ornithology (study of birds). The objective is to establish the bases in order to evaluate and orient actions for restoration of forests and biological corridors.

CONCLUSION

Guatemala is a country in the throes of development and is following the trends at international level in the subjects of forestry and environmental certification; the private sector is identified as a key player in forest restoration of the countryside; the sugar sector of Guatemala has set a precedent in the investment, implementation of investigation and actions in forest restoration as a strategy of environmental responsibility, productivity and mitigation of climate change in the Pacific littoral of Guatemala.

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